

## CLAIMS

## 1. A radio system comprising:

5 a radio transmission apparatus provided with a transmission section that transmits a radio signal which multiplexes a modulated signal without the signal being carried on a center frequency and a pilot signal having a center frequency identical to said center frequency; and

10 a radio reception apparatus provided with an antenna that receives said radio signal, a distribution section that distributes the received signal received by said antenna into two directions, an extraction section that extracts a signal component corresponding to said pilot  
15 signal from one received signal distributed by said distribution section and outputs the signal component, a delay addition section that gives a delay to the other received signal distributed by said distribution section and outputs the signal and a quadrature demodulation  
20 section that frequency-multiplies the output signal of said extraction section by the output signal of said delay addition section and carries out quadrature demodulation.

## 2. A radio reception apparatus comprising:

25 an antenna that receives a radio signal which multiplexes a modulated signal without the signal being carried on a center frequency and a pilot signal having

a center frequency identical to said center frequency;

a distribution section that distributes the received signal received by said antenna into two directions;

an extraction section that extracts a signal component corresponding to the pilot signal having a center frequency identical to the center frequency from one signal distributed by said distribution section;

a delay addition section that gives a delay to the other received signal distributed by said distribution section; and

a quadrature demodulation section that frequency-multiplies a signal component corresponding to said pilot signal extracted by said extraction section by said other signal with a delay added thereto by said delay addition section and carries out quadrature demodulation.

3. The radio reception apparatus according to claim 2, wherein said quadrature demodulation section comprises:

a phase shift section that applies a 90-degree phase shift to a signal component corresponding to said extracted pilot signal;

a first frequency multiplier that multiplies said other signal with said delay added thereto by a signal component corresponding to said pilot signal with said 90-degree phase shift applied thereto;

a second frequency multiplier that multiplies said

other signal with said delay added thereto by a signal component corresponding to said pilot signal; and

another delay addition section that adds a delay equivalent to a delay generated by said phase shift section to a signal component corresponding to said pilot signal multiplied by said second frequency multiplier.

4. The radio reception apparatus according to claim 2, further comprising an amplification section that amplifies said one signal distributed by said distribution section and outputs the amplified signal to said extraction section.

5. The radio reception apparatus according to claim 2, further comprising:

a reception power calculation section that calculates a reception power value of said received signal based on amplitude of an output signal of said quadrature demodulation section; and

a variable gain amplification section that is disposed before said distribution section and amplifies said received signal according to said reception power value.

6. The radio reception apparatus according to claim 2, further comprising:

a temperature measuring section that measures a

temperature; and

a delay amount calculation section that calculates an amount of delay based on said temperature,

wherein said delay addition section changes a delay  
5 to be added based on said amount of delay calculated.

7. The radio reception apparatus according to claim 2,  
wherein said quadrature demodulation section is used as  
a frequency multiplication section that  
10 frequency-multiplies a signal component corresponding  
to said pilot signal extracted by said extraction section  
by an output signal of said delay addition section.

8. The radio reception apparatus according to claim 2  
15 to which a superheterodyne scheme is applied, further  
comprising:

a filter bandwidth control section that generates  
a control signal for controlling a filter bandwidth;

a local signal oscillation section that controls  
20 and oscillates a bandwidth of a local oscillation signal  
based on said control signal; and

a frequency multiplication section that is disposed  
before said distribution section and  
frequency-multiplies said received signal by a local  
25 oscillation signal whose said bandwidth is controlled,

wherein said extraction section changes the  
bandwidth to be extracted based on said control signal.

9. The radio reception apparatus according to claim 2, further comprising:

5 a reception power calculation section that calculates a reception power value of said received signal based on amplitude of an output signal of said quadrature demodulation section; and

10 a variable gain amplification section that amplifies a signal subjected to quadrature demodulation by the quadrature demodulation section according to said reception power value.

10. The radio reception apparatus according to claim 2, further comprising a band limiting filter that is disposed  
15 before said delay addition section that removes a signal component corresponding to a pilot signal having a center frequency identical to the center frequency of said other signal distributed by said distribution section from said other signal.

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11. A radio transmission apparatus that transmits a multiplexed signal which multiplexes a modulated signal without the signal being carried on a center frequency and a pilot signal having a center frequency identical  
25 to said center frequency, comprising:

a modulated signal generation section that generates said modulated signal;

a local oscillation signal generation section that generates a local oscillation signal;

a quadrature modulation section that frequency-multiplies said modulated signal using said  
5 local oscillation signal generated by said local oscillation signal generation section, increases the frequency and performs quadrature modulation;

a delay addition section that adds a delay to said local oscillation signal generated by said local  
10 oscillation signal generation section; and

a combiner that multiplexes a signal after said quadrature demodulation by said quadrature demodulation section with a local oscillation signal as said pilot signal with a delay added by said delay addition section  
15 so that the phases of the signals match after said quadrature demodulation.